SOLAR ELECTRIC

KOSTAL

IMAGE MAY DIFFER

11 / 2013

Smart connections.

Short Manual

PIKO BA-Inverter with Energy Management

EU Declaration of conformity

The company

KOSTAL Solar Electric GmbH
Hanferstraße 6
79108 Freiburg i. Br.
Germany

hereby declares that the inverter **PIKO BA** to which this declaration refers, conforms to the following guidelines and standards.

European Standards including relevant amendments

EN 61000-3-2:2006 / A1:2009 / A2:2009 (Harmonic currents)

EN 61000-3-3:2008 (Flicker)

EN 61000-6-2:2005 / AC:2005
(Interference resistance for industrial environments)

EN 61000-6-3:2007 / A1:2011
(Interference emission for domestic environments)

EN 62109-1: 2010 (safety of power converters Part 1)

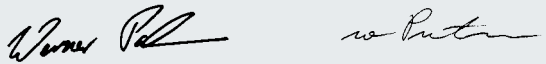
EN 62109-2: 2011 (safety of power converters Part 2)

Directive 2004/108/EC Electromagnetic compatibility

Directive 2006/95/EC Electrical Apparatus Low Voltage Directive

Application of the CE marking in accordance with Appendix III, Section B:2013

KOSTAL Solar Electric GmbH – 2013-07-01



Werner Palm (Managing Director) Armin von Preetzmann (Development Manager)

This declaration applies to all identical copies of this product.

This declaration loses its validity if the device is modified or incorrectly connected.

This declaration certifies compliance with the mentioned regulations but does not ensure the properties.

The safety instructions in the product documentation provided must be observed!

Proper use

The PIKO BA-Inverter converts DC current into AC current.

The current can be used for the following:

- for consumption
- to store the current in the battery of the system (PIKO BA-System)
- for feeds into the public mains grid

The unit may only be used in grid-connected photovoltaic systems within the permissible power range and under the permissible environmental conditions. The device is not intended for mobile use.

Inappropriate use can be hazardous and lead to injury or even death of the user or third parties. Material damage to the device and other equipment can also occur. The inverter may therefore only be used for its intended purpose.

The PIKO BA-Inverter is equipped with an energy management system. This system controls based on technical and economic aspects of the use of electricity generated.

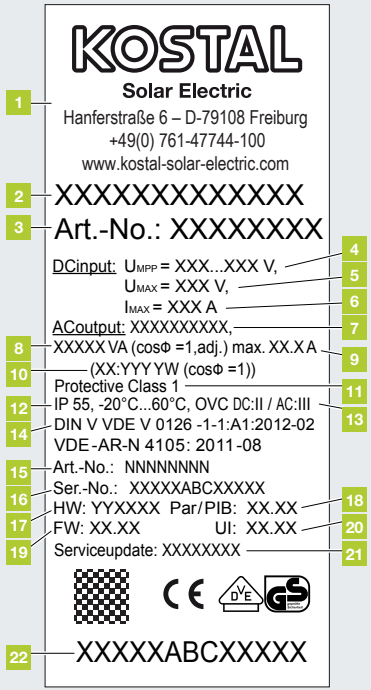
Exclusion of liability

Any use that differs from or goes beyond the stated intended purpose is considered inappropriate. The manufacturer accepts no liability for any damage resulting from this. Modifications to the inverter are prohibited. The inverter may only be used if safe to operate and in technically perfect condition. Any instance of misuse will cause the termination of the warranty, guarantee and general liability of the manufacturer.

Only a qualified electrician may open the device. The inverter must be installed by an electrician who is responsible for observing the applicable standards and regulations. Work that could affect the electrical power system of the respective utility company at the site of the solar energy feed-in may only be carried out by qualified electricians expressly authorised (licensed) by the utility company.

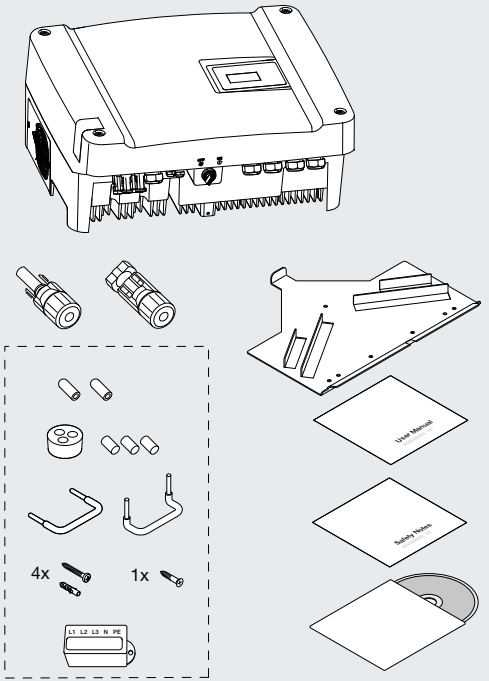
This includes changes to the factory preset parameters. The installer must always observe the regulations of the utility company. The utility company‘s specifications must always be observed when setting the parameters.

Type plate



1. Name and address of manufacturer
2. Device type
3. Item number
4. MPP control range
5. Maximum input voltage DC
6. Maximum DC input current
7. Number of feed-in phases / Output voltage (nominal)
8. Maximum AC power
9. Maximum output current AC
10. Deviating output with country setting
11. Protective Class to IEC 62103
12. Protection type and ambient temperature range
13. Over voltage category
14. Requirements conforming to those of the built-in grid monitoring
15. Internal Item number
16. Serial number
17. Version of hardware
18. Version of parameter set
19. Version of firmware
20. Version of user interface
21. Date of the last update
22. Removable guarantee label

Scope of delivery



Selecting the installation side

NOTE
Observe the following instructions, or else warranty claims will be restricted.

Protect from rain and water.

Protect from direct sunlight.

Select non-flammable installation location.

Maintain safe distance from flammable materials or areas at risk of explosion.

Select vertical installation location.

Ambient temperature must be between -20 °C and +60 °C.
Air humidity must be between 4 % and 100 % (condensing).

Select stable installation location.
No plasterboard or wooden walls.

Prevent access by children.

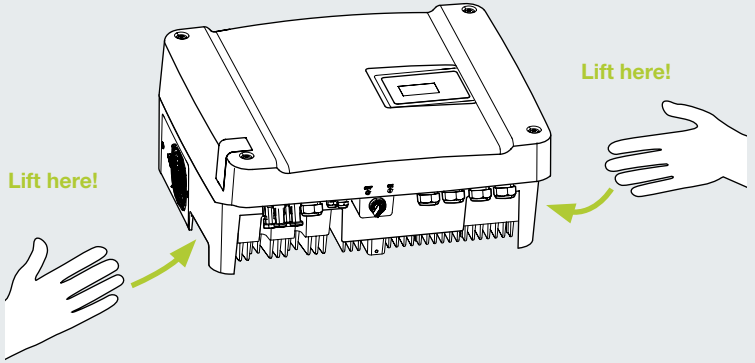
Required cooling space is 200 mm vertical and 100 mm horizontal.

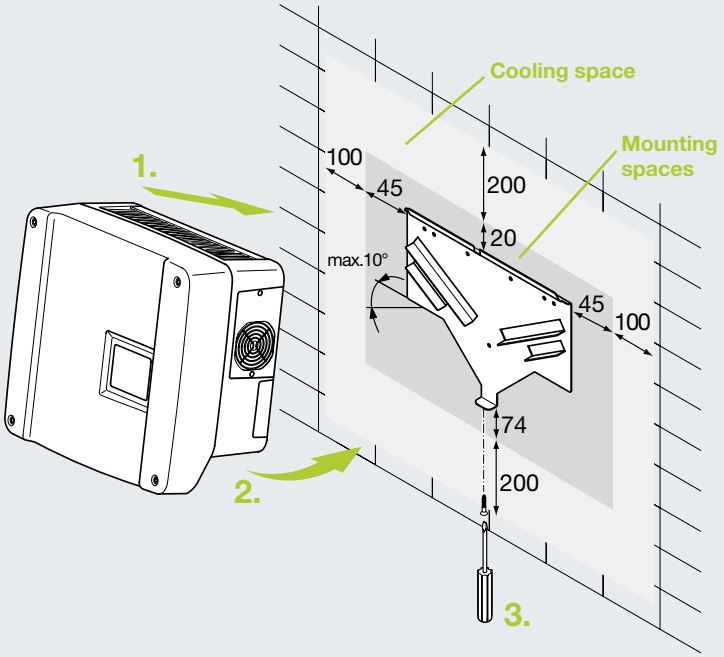
Protect from dust, contamination and ammonia.

Ensure easy access and visible display.

Ensure that people are not disturbed by operating noise.

To lift the inverter





Connecting AC and DC side

LEBENSGEFAHR DURCH STROMSCHLAG!
Wechselrichter spannungsfrei schalten.

RISK OF DEATH DUE TO ELECTRICAL SHOCK!
De-energise the inverter.

DANGER DE MORT PAR ÉLECTROCUTION !
Mettre l'onduleur hors tension.

¡PELIGRO DE MUERTE DEBIDO A ELECTROCUCIÓN!
Desconectar el inversor de la tensión.

PERIGO DE MORTE DEVIDO A CHOQUE ELÉTRICO!
Desligar a tensão de corrente do inversor.

PERICOLO DI MORTE PER SCOSSA ELETTRICA!
Eliminare la tensione dall'inverter.

LIVSFARE PGA. ELEKTRISK STØD!
Vekselstrømsomformeren skal kobles fra spændingen.

LEVENSGEVAAR DOOR ELEKTRISCHE SCHOK!
Schakel de omvormer spanningsvrij.

OHROŽENÍ ŽIVOTA ELEKTRICKÝM PROUDEM!
Odpojte střídač od napětí.

PERICOL DE ELECTROCUTARE!
Scoateți ondulorul de sub tensiune.

SMRTNA NEVARNOST ZARADI ELEKTRIČNEGA UDARA!
Razsmernik odklopite iz električne napetosti.

NEBEZPEČENSTVO OHROZENIA ŽIVOTA ZÁSAHOM ELEKTRICKÉHO PRÚDU!
Menič prepnite do beznapäťovej prevádzky.

ELEKTRIK ÇARPMASI NEDENIYLE HAYATI TEHLIKE!
İnvertörü gerilimsiz hale getirin.

ΚΙΝΔΥΝΟΣ ΘΑΝΑΤΟΥ ΑΠΟ ΗΛΕΚΤΡΟΠΛΗΞΙΑ!
Αποσυνδέστε τον αντιστροφέα από το ρεύμα.

ОПАСНОСТ ЗА ЖИВОТА ПОРАДИ ТОКОВ УДАР.
Изключвайте инвертора от напрежението.

LIVSFARA PÅ GRUND AV ELEKTRISK STÖT!
Koppla växelriktaren spänningsfri.

ZAGROŻENIE ŻYCIA PRZEZ PORAŻENIE PRĄDEM!
Odłączyć falownik od zasilania.

ELEKTRILÖÖGI OHT!
Lahutage vaheldi vooluvõrgust.

PAVOJUS GYVYBEI DĖL ELEKTROS SROVĖS SMŪGIO!
Inverteriui nutraukite įtampos tiekimą.

ELEKTRISKĀS STRĀVAS TRIECIENA BRIESMAS!
Atslēgt invertoru no strāvas.

OPASNOST PO ŽIVOT OD STRUJNOG UDARA!
Isključiti izmjenjivač.

OPASNOST PO ŽIVOT ZBOG STRUJNOG UDARA!
Isključiti izmjenjivač.

OPASNOST PO ŽIVOT USLIJED STRUJNOG UDARA!
Izmjenjivač isključite sa naponskog napajanja.

OPASNOST PO ŽIVOT USLED STRUJNOG UDARA!
Izmenjivač isključite sa naponskog napajanja.

De-energising inverter:

Switch off DC side
1. At Inverter
2. At Batterysystem (when connected)

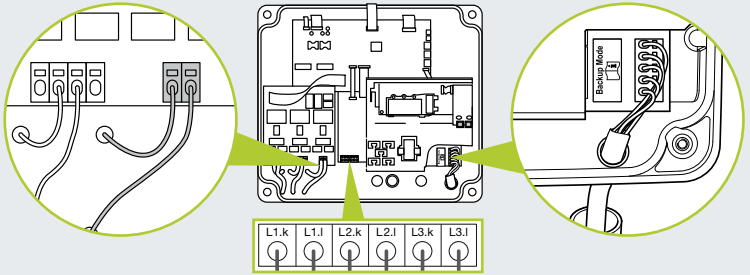
Switch off
- AC side
- S0/AL-out
- Battery
(when connected)

Safeguard

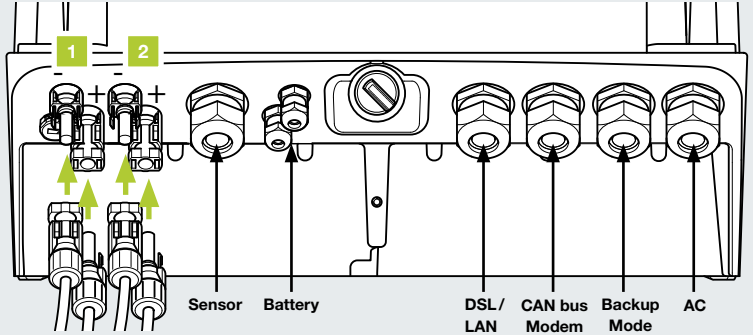
Disconnect DC side

Wait 5 minutes

Connecting AC, DC and battery side

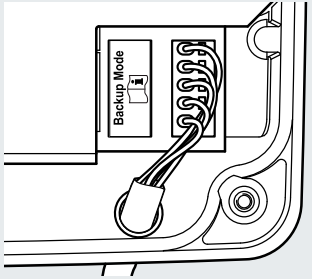


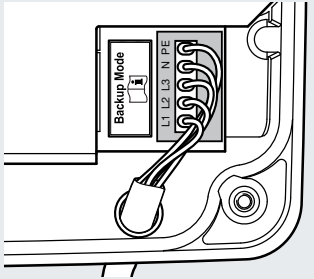
Connecting battery | Connecting sensor | Connecting AC



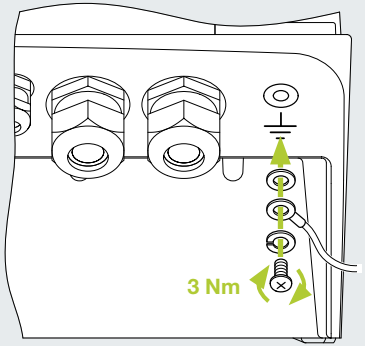
Connecting DC side

Country-specific installation



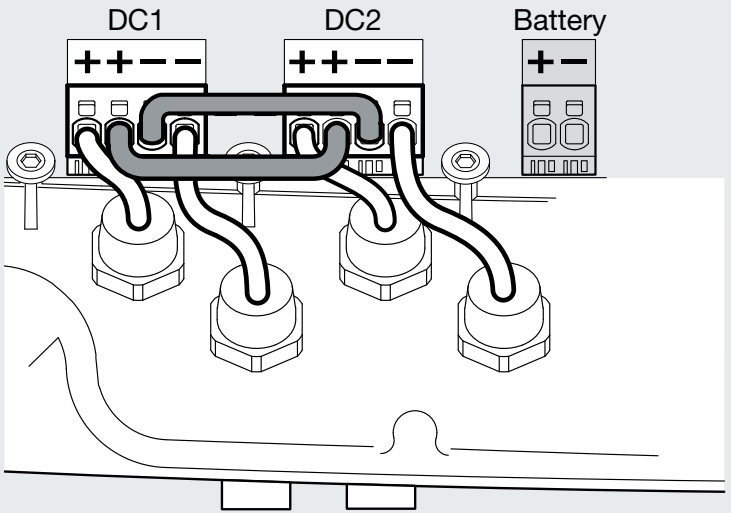


Connecting main cable with sealing cap



Second ground connection

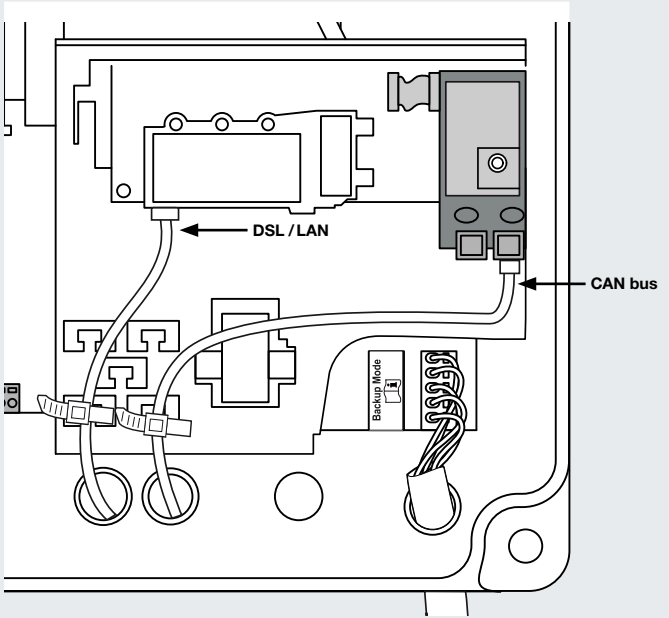
Option: Connecting DC1 & DC2 in parallel



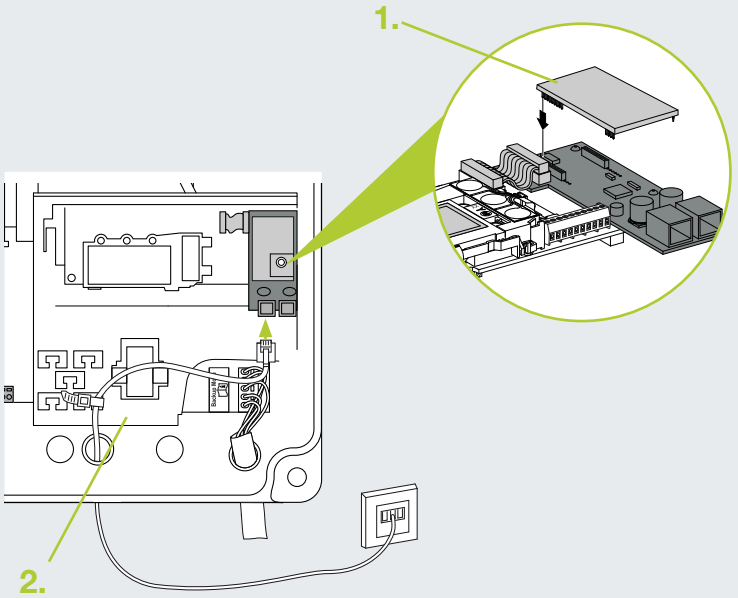
NOTE
When using the parallel connection this feature must be activated under the menue Settings >> Hardware settings >> String connection >> Parallel connection.

Data transfer Communicationboard II

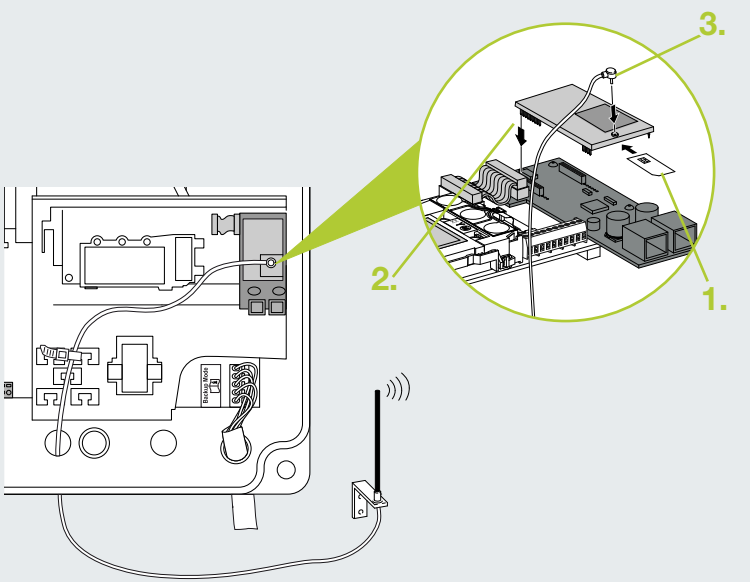
DSL or LAN and CAN bus



Analogue modem

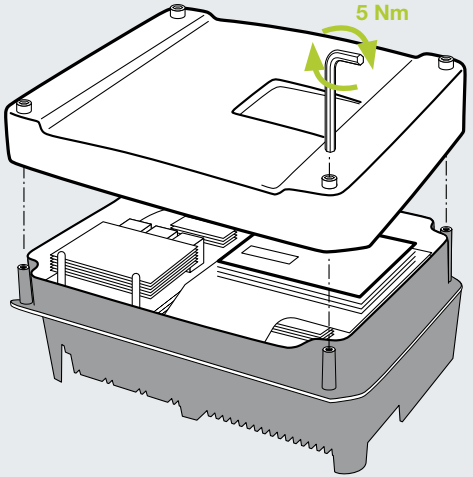


GSM modem

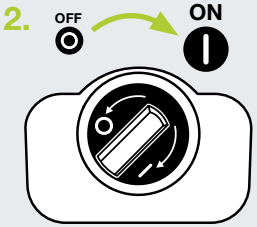


NOTE
Before installing a modem, read the user manual.

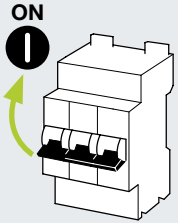
1.

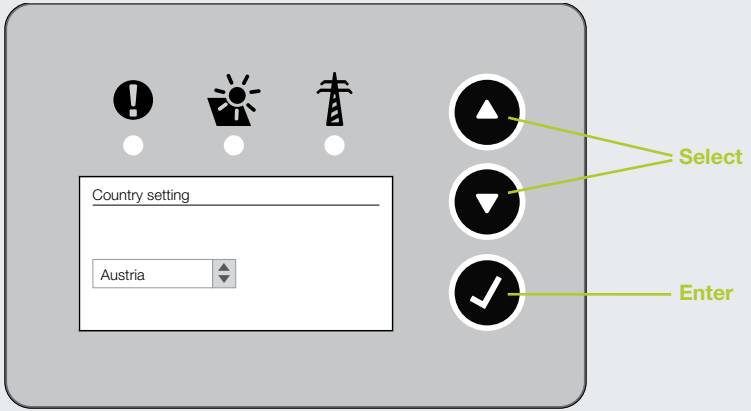


2.



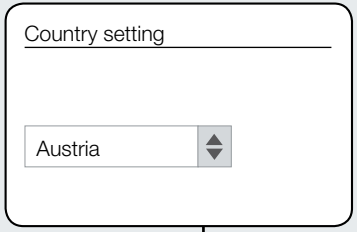
3.





NOTE
Country setting „Germany VDE 0126“ may only be used with inverters installed in PV plants connected to the grid before 31.12.2011. (No displacement factor cosφ preset.)

Selecting the country of use



1. Select country
2. Enter

3. Select YES
4. Enter

Menu overview*, DC and AC

DC menu **Settings menu** **AC menu**

Battery menu **Own consumption menu**

DC menu

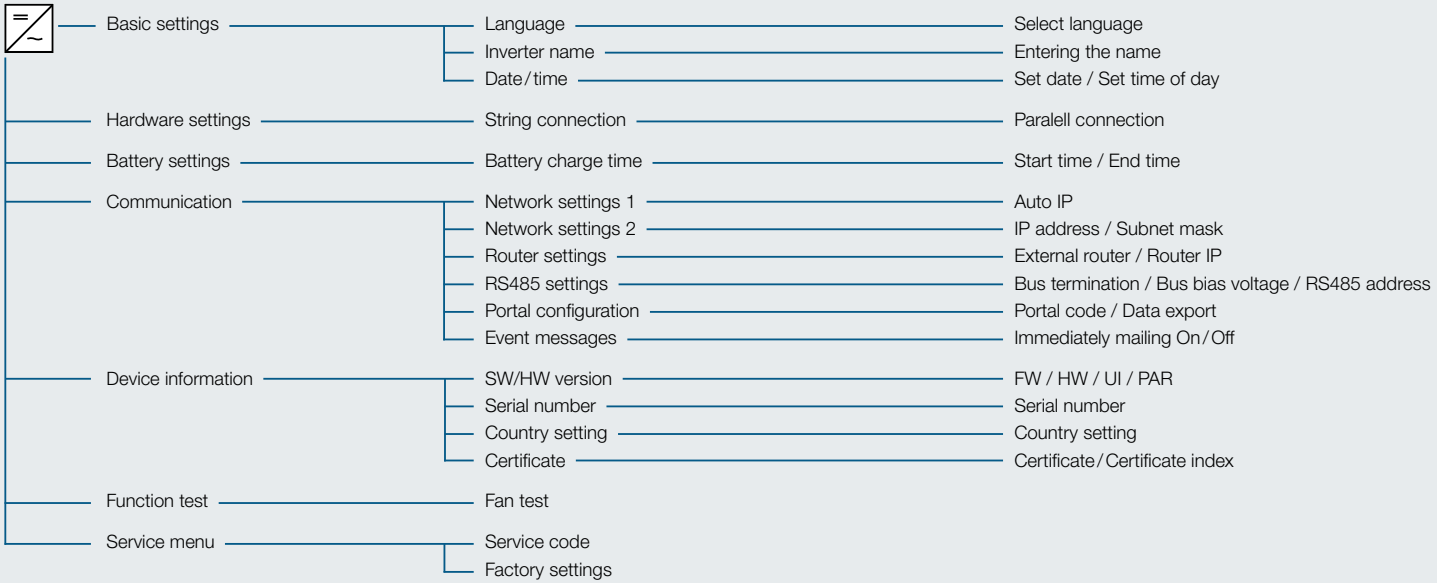
- DC input 1 (U,I,P)
- DC input 2 (U,I,P)

AC menu

- Phase 1 (U,I,P)
- Phase 2 (U,I,P)
- Phase 3 (U,I,P)
- Total yield
  - Yield (MWh)
  - Operation time (h)
- Grid parameters
  - Limitation on (%)
  - Grid frequency (Hz)
  - cos φ
- Daily yield (diagram)
- Monthly yield (diagram)
- Annual yield (diagram)
- Total yield (diagram)

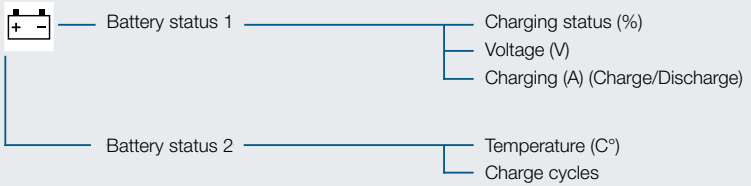
*Deviations due to software versions (UI level) is possible.

Settings menu*

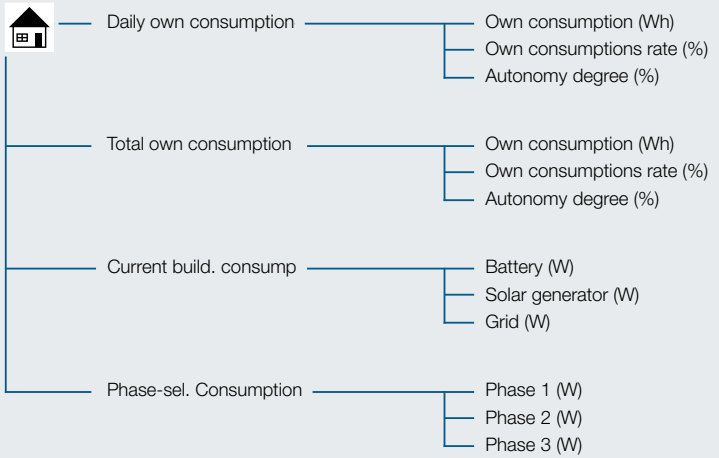


*Deviations due to software versions (UI level) is possible.

Menu Battery*



Menu Consumption*



*Deviations due to software versions (UI level) is possible.

Technical data

PIKO BA-Inverter	Unit	
Input side (DC)		
Inverter type		PIKO BA
Max. PV power	kWp	11
Recommended PV power	kWp	4 - 11
MPP range with rated DC power	V	440 - 850
Max. input voltage (U_{dcmax})	V	950
Min. input voltage (U_{dcmin})	V	180
Rated input current	A	11,5
Max. input current (I_{dcmax})	A	12
Max. input current with parallel connection	A	24
Number of DC inputs		2
Number of independent MPP trackers		2
Battery input side (DC)		
Max. battery input voltage	V	314
Min. battery input voltage	V	211
Rated voltage battery input	V	228
Max. charge current	A	12
Max. discharge current	A	12

PIKO BA-Inverter	Unit	
Output side (AC)		
Rated output, cos j = 1 ($P_{ac,r}$)	kW	10
Max. output apparent power, cos φ, adj	kVA	10
Rated output current	A	14,5
Max. output current (I_{acmax})	A	17,5
short circuit current (Peak / RMS)	A	566 / 12,2
Number of feed-in phases		3
Grid connection		3/N/PE, AC, 400V
Rated frequency (f_r)	Hz	50
Ext. current sensor		
Rated current primary	A	50
Precision method		1
Dimensions (H x W x D)	mm (inch)	90 x 105 x 54 (3.54 x 4.13 x 2.13)
Max. cable diameter	mm (inch)	13,5 (0.53)
Mounting on top hat rail to DIN EN 60715		✓
Efficiencies		
Max. efficiency	%	96,5
Max. European efficiency rate	%	95,3

PIKO BA-Inverter	Unit	
System data		
Topology: without galvanic separation - transformerless		✓
Internal protection according to IEC 60529		IP 55
Protection class according to IEC 62103		I
Overvoltage category according to IEC 60664-1 Input side (PV-generator)		II
Overvoltage category according to IEC 60664-1 Output side (grid connection)		III
Degree of contamination		3
Enviromental category (outdoor installation)		✓
Enviromental category (interior installation)		✓
UV-resistance		✓
Minimum cable cross-section of AC-connect-inline	mm^2	2,5
Minimum cable cross-section of DC-connect-inline	mm^2	4
Min. fusing on output side		B25, C25
Tightening torque of PE connection, outer	Nm	3
Tightening torque of lid screws	Nm	5
Operation protection		RCCB Typ B nach EN62109-2

PIKO BA-Inverter	Unit	
System data		
Electronic disconnection device integrated		✓
Height	mm (inch)	450 (17.72)
Width	mm (inch)	520 (20.47)
Depth	mm (inch)	230 (9.06)
Weight	kg (lb)	33 (72,75)
Max. air throughput	m^3/h	188
Max. noise emission	dBA	46
Ambient temperature	°C (°F)	-20...60 (-4...160)
Max. installation altitude	m above sea level	2000
Relative humidity (condensing)	%	4…100
Connection technology at input side – MC 4		✓
Connection technology at output side – spring-loaded terminal strip		✓
Various		
Warranty	Years	5
Warranty extension optional	Years	10/20

SOLAR ELECTRIC

KOSTAL

Service Hotline

Germany and other countries [1]	+49 761 47 74 42 22
France Belgium, Luxembourg	+33 1 6138 4117
Greece	+30 2310 477 555
Italy	+39 011 97 82 420
Spain Portugal [2]	+34 961 824 927

[1] Language: German, English
[2] Language: Spanish, English

Smart connections.

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11/2013 edition, subject to technical changes and printing errors.